Breeding of Aedes aegypti and its Impact on Dengue/DHF in Rural Areas

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Abstract
A survey was undertaken to ascertain the Aedes indices in Ashawati and Tauri villages of Faridabad and Gurgaon districts of Haryana state, India, during September 1996. The House Index, Container Index and Breteau Index recorded in Tauru village were 33.3, 21.0 and 40.0, while in Ashawati village these indices were 13.6, 2.8 and 10.3 respectively.

Introduction
During 1996, there was an outbreak of dengue/DHF in several localities of Delhi and cases were also reported from urban and rural areas of the adjoining districts of Faridabad and Gurgaon in Haryana state. Dengue/DHF was earlier considered to be confined to urban areas (1,2), but this infection has now also been reported from rural areas of the states of Maharashtra, Karnataka and Tamil Nadu (3,4,5). Aedes aegypti has now made successful inroads into rural areas as well (6).

Consequent upon the reporting of suspected cases of dengue/DHF from Ashawati in Faridabad district and a suspected death due to dengue from Tauru in Gurgaon district, a rapid entomological survey for Aedes aegypti mosquito was carried out in these villages to find out whether the cases were imported or it was an indigenous transmission. The findings of the study are presented in this paper.

Study area
Ashawati is a typical rural village which is situated some 35 km away from the district headquarters. Houses were a mix of mudplastered walls with thatched roofs and brickwalled with cemented plaster. The village is surrounded by agricultural fields and the main occupation of the residents was agriculture. Many of the villagers worked in factories located in Faridabad.
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Tauru village falls under Gurgaon district and is approximately 50 km from the district headquarters. It is a semi-urbanized village with cemented houses. The main occupation of the villagers was agriculture but many of them were working in government and semi-government offices. In both villages people stored water in various types of containers due to shortage of piped water supply. Desert-coolers were also in use in a few houses.

**Methodology**

The survey for *Aedes aegypti* mosquito breeding was carried out in the villages using the single larva technique. The larvae were collected for species identification and water was removed to destroy the foci of breeding.

**Results and discussion**

The House, Container and Breteau indices and various containers found positive during the *Aedes* survey are given in Tables 1 & 2.

**Table 1:** Results of *Aedes* survey undertaken in Ashawati and Tauru

<table>
<thead>
<tr>
<th>Name of village</th>
<th>No. of houses searched</th>
<th>Houses found +ve</th>
<th>House Index</th>
<th>Containers found +ve</th>
<th>Container Index</th>
<th>Breteau Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashawati</td>
<td>29</td>
<td>3</td>
<td>10.3</td>
<td>107</td>
<td>3</td>
<td>2.8</td>
</tr>
<tr>
<td>Tauru</td>
<td>30</td>
<td>10</td>
<td>33.3</td>
<td>57</td>
<td>12</td>
<td>21.0</td>
</tr>
</tbody>
</table>

**Table 2:** Containers searched and found positive for *Aedes* breeding in Ashawati and Tauru villages

<table>
<thead>
<tr>
<th>S.No</th>
<th>Type of container</th>
<th>Ashawati</th>
<th>Tauru</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. searched</td>
<td>No. found positive</td>
<td>No. searched</td>
</tr>
<tr>
<td>1</td>
<td>Drum</td>
<td>7</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Earthen pot</td>
<td>78</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Desert cooler</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>Cement tank</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Money-plant bottle</td>
<td>7</td>
<td>–</td>
</tr>
<tr>
<td>6</td>
<td>Bucket</td>
<td>5</td>
<td>–</td>
</tr>
<tr>
<td>7</td>
<td>Tyre</td>
<td>7</td>
<td>–</td>
</tr>
</tbody>
</table>

Results of the survey revealed that the House, Container and Breteau Indices in Tauru were very high, i.e. 33.3, 21.0 and 40.0, while these indices in Ashawati were 10.3, 2.8 and 10.3 respectively. Containers commonly found positive for *Aedes* breeding in Ashawati village were earthen pots and cement tanks whereas in Tauru village these were metal drums and earthen pots.

During the entomological investigations carried out in Ajmer it had been observed that the *Aedes* breeding index in the inner and outer peripheral zones of the town was very low, i.e. 1.6% and 0.5% respectively, but the population affected with dengue exceeded 15%. On the other hand, in the central zone of the city where most of the offices, schools, markets and cinema halls were located, the *Aedes* breeding index was 43.7% and more than 40% of the population was affected with dengue fever. People living on the periphery of Ajmer city were found to be visiting the central parts during the day time and were exposed to *Aedes* bites. Hence the population residing on the periphery of Ajmer town acquired infection.
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From the central part where the Aedes breeding index was high.

In the present study it was clear that Aedes aegypti had established itself in these villages of Haryana state and there was frequent movement of their populations to the nearby towns and to Delhi. Therefore, there was a possibility that the people there may have acquired infection while visiting the towns, and the high Aedes densities might have triggered the indigenous transmission. Therefore, it will be worthwhile to monitor Aedes indices in villages bordering big towns while planning control strategies for dengue/DHF outbreaks.

References


